a pair of electrodes spaced apart in an opposing relationship so as to form a gas flow space therebetween, at least one of said electrodes having a plurality of parallel grooves formed on a surface thereof facing said gas flow space;

electrically conductive members for connecting said electrodes to a power source to apply a voltage between said electrodes and thereby generate an electric discharge between said electrodes;

a dielectric arranged between said electrodes; and

a gas flow passage including an inlet port for supplying a material gas into said gas flow space, and including an outlet port for discharging the material gas from said gas flow space, said gas flow passage being arranged so that the material gas flows through said gas flow space in a direction transverse to a longitudinal direction of said parallel grooves.

14. (New) The ozone generator of claim 13, wherein a first one of said electrodes has said parallel grooves formed on a surface thereof, a second one of said electrodes having a flat surface facing said gas flow space, said dielectric being arranged so as to cover said flat surface of said second one of said electrodes.

15. (New) The ozone generator of claim 13, wherein each of said electrodes comprises a disk-shaped electrode, said gas flow passage including an annular passage at an outer periphery of said electrodes, a central passage at a center position of said electrodes, and a radial guide passage extending in a radial direction with respect to said electrodes and communicating with said central passage, said gas flow space comprising a disk-shaped space communicating with said annular passage and said central passage.

16. (New) The ozone generator of claim 13, further comprising a holding plate supporting an insulating plate and supporting a first one of said electrodes on said insulating plate, said holding plate and a second one of said electrodes each having a cooling medium passage formed therein for allowing an electrically conductive cooling medium to flow through at least one of said cooling

medium passage of said holding plate and said cooling medium passage of said second one of said electrodes.

17. (New) The ozone generator of claim 13, further comprising a plurality of pairs of electrodes arranged in a stack, each of said pairs of electrodes being spaced apart in an opposing relationship so as to form a gas flow space therebetween, at least one of each of said pairs of electrodes having a plurality of parallel grooves formed on a surface thereof facing said gas flow space.

18. (New) The ozone generator of claim 13, wherein said dielectric comprises a sapphire.

19. (New) An electric discharge cell for an ozone generator, comprising:

a pair of electrodes spaced apart in an opposing relationship so as to form a gas flow space therebetween, a first one of said electrodes having a plurality of concentric circular grooves formed on a disk-shaped surface thereof facing said gas flow space, and a second one of said electrodes having a flat dielectric plate arranged on and covering a disk-shaped surface thereof facing said gas flow space;

electrically conductive members for connecting said electrodes to a power source; and

a gas flow passage including an inlet port for supplying a material gas into said gas flow space, and including an outlet port for discharging the material gas from said gas flow space, said gas flow passage being arranged so that the material gas flows through said gas flow space in a radial direction transverse to said concentric circular grooves.

20. (New) The electric discharge cell of claim 19, wherein said dielectric comprises a sapphire.

21. (New) The electric discharge cell of claim 19, wherein said inlet port of said gas flow passage is located at an outer periphery of said electrodes so that the material gas flows through said

gas flow space in a radially-inward direction from the outer periphery of said electrodes to a center of said electrodes.

22. (New) The electric discharge cell of claim 19, further comprising a holding plate supporting an insulating plate and supporting a supported one of said first one of said electrodes and said second one of said electrodes on said insulating plate, said holding plate and a non-supported one of said first one of said electrodes and said second one of said electrodes each having a cooling medium passage formed therein for allowing an electrically conductive cooling medium to flow through at least one of said cooling medium passage of said holding plate and said cooling medium passage of said non-supported one of said electrodes.

23. (New) An ozone generator comprising a plurality of electric discharge cells of claim 22 arranged in a stack, said cooling medium passage of said holding plate of each of said electric discharge cells having an inlet port at an outer periphery of said holding plate and having an outlet port at said outer periphery of said holding plate, said cooling medium passage of said non-supported one of said electrodes of each of said electric discharge cells having an inlet port at an outer periphery of said non-supported one of said electrodes and having an outlet port at said outer periphery of said non-supported one of said electrodes, said outlet port of said cooling medium passage of said holding plate communicating with said inlet port of said cooling medium passage of said non-supported one of said electrodes in each of said electric discharge cells, the electrically conductive cooling medium comprising water.